

An aerial photograph of a forest stream. The stream is filled with numerous fallen logs and branches, creating a natural dam or barrier. The surrounding forest is dense with green trees. A dirt road is visible on the left side of the image.

# 2020 Aquatic and Riparian Restoration Annual Report

**USDA Forest Service  
Pacific Northwest Region**



# ***USDA Forest Service Pacific Northwest Region 2020 Aquatic and Riparian Restoration Annual Report***

Each year, the Forest Fish and Watershed program managers select a watershed restoration project to showcase in our Regional Aquatic and Riparian Restoration Annual Report and each year we're blown away by the significance and diversity of the examples of the restoration actions accomplished throughout the Region. 2020 was no exception. Despite the global pandemic, reduced available aquatic restoration funds, limited capacity to accomplish everything on our plates, and a hellacious wildfire season, we were still amazed at the quality accomplishments that emerged from the challenges. When we consider them as a subset of all the aquatic and riparian restoration project accomplishments, we're even more amazed at the resilience, drive, and dedication towards aquatic resources displayed by our Forest and District personnel and their partners. We look forward to another promising year in 2021, as we continue work with our partners to restore watersheds on a priority basis.

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# Columbia River Gorge National Scenic Area Horsetail Creek Floodplain Restoration - Phase 2

In 2013, Columbia River Gorge National Scenic Area (CRGNSA) partnered with the Lower Columbia Estuary Partnership (LCEP) to improve holding and rearing habitat for migrant adult and juvenile fish, respectively, at a 190-acre floodplain adjacent to the Columbia River. Deemed an Essential Project in CRGNSA's 2011 Tanner/Hamilton Watershed Action Plan, Horsetail Creek Floodplain Restoration project has the potential to benefit 13 federally listed (Endangered Species Act) fish species! The Phase I portion of the project focused on the west end of the floodplain area (35 acres). It re-contoured portions of Horsetail and Oneonta Creeks to mimic more natural conditions in order to restore channel connectivity and function; filled a relic gravel pit and converted it into backwater channels and emergent wetland; placed 496 pieces of large wood; retrofitted the culvert under Interstate 84 freeway to improve fish passage; sprayed invasive plants; and planted native vegetation.

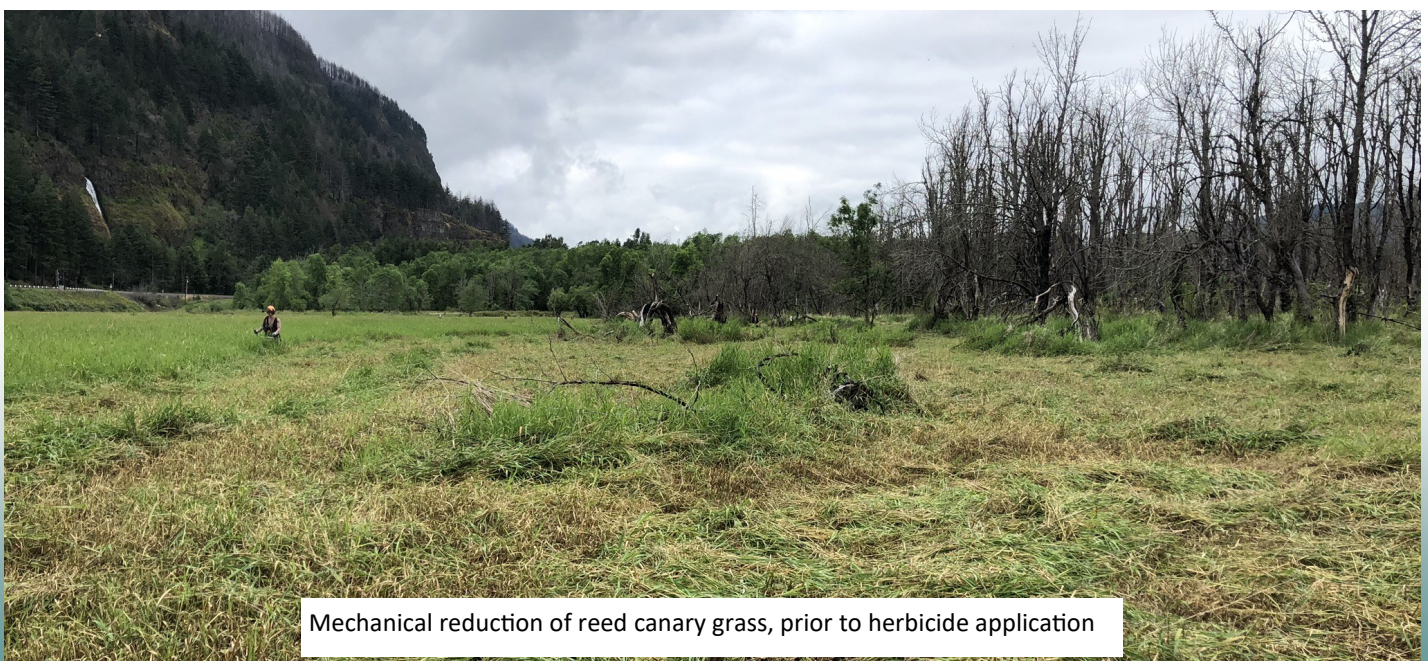
Now in 2020, Phase II works eastward, continuing floodplain restoration work by adding more holding/rearing habitat in back-water sloughs, treating riparian



Harvesting willow stakes for riparian planting



Falling trees for Horsetail Creek slough



Mechanical reduction of reed canary grass, prior to herbicide application



invasive plants and planting native vegetation. 29 partially burned ash trees (burned by the 2017 Eagle Creek fire) were felled into backwater sloughs by CRNGSA fire crews to provide more holding/rearing habitat for federally listed fish. To be able to improve plant habitat, LCEP secured funding from the Oregon Watershed Enhancement Board and The Nature Conservancy. Invasive plants (e.g. reed canary grass, Himalayan blackberry) were treated multiple times by mechanical and/or chemical methods over 31 acres. 7,500 willow live stakes were planted, and next year, 57,500 shrubs and trees will also be planted to further this restoration effort, with follow-up spraying and plant monitoring. As these plants mature, they will provide needed thermal shading for federally listed fish, and riparian nesting habitat for migratory birds as well.

Project and Area Contacts : Brett Carre, Area Fish Biologist (541-308-1718, [brett.carre@usda.gov](mailto:brett.carre@usda.gov)), Diane Hopster, Forest Hydrologist (541-308-1732, [diane.hopster@usda.gov](mailto:diane.hopster@usda.gov)), and Sarah Callaghan , Area Botanist (541-308-1717, [sarah.callaghan@usda.gov](mailto:sarah.callaghan@usda.gov)).



Planting willow stakes at Horsetail Creek





# Colville National Forest Scatter Creek AOP

For decades, upstream-migrating fish in Scatter Creek were confined to a scoured outlet pool downstream of the Rattlesnake Road (FS 5320). The culvert at the crossing was perched and its flow was too fast, not allowing upstream access. In 2020, passage at Rattlesnake Road was restored.



Old, impassable crossing at Rattlesnake Road



New stream simulation crossing at Rattlesnake Road

Prior to project implementation, the aquatics crew removed fish from the project area. They first set net barriers upstream and downstream of the site to prevent fish from getting into the site. Then using electrofishing gear, they netted all the fish and moved them from the project area. Water was diverted from the project site with a large pipe and sump pump. Footers were installed and a new stream bed (complete with grade control structures) was placed between the footers, simulating the natural stream bed upstream and downstream of the crossing. The new crossing, a multiplate structure, was constructed upon the footers.



Aquatics crew salvaging fish



Installing Multiplate Culvert

For more information on the aquatic restoration projects on the Colville National Forest, contact Karen Honeycutt, Forest Natural Resources Staff Officer (509-684-7224, [karen.honeycutt@usda.gov](mailto:karen.honeycutt@usda.gov)).



# Deschutes National Forest Upper Little Deschutes Restoration

The Upper Little Deschutes River Restoration Project was implemented to restore a broad range of riparian and terrestrial values on the Upper Little Deschutes River. With numerous high priority breeding sites for the federally threatened Oregon spotted frog, important elk habitat, and stream habitat for various trout species on the line, project partners readily volunteered to help with the restoration.

In 2020, an illegal diversion ditch was closed using local materials to plug and fill the channel and recontour the banks, leaving open “ponds” for Oregon spotted frog. An excavator operated by the forest road crew installed 28 instream structures on the mainstem of the river. Encroaching lodgepole pine in riparian habitats were removed and utilized to create 8 beaver dam analog structures in the portion of the diversion ditch that was left open. An unauthorized bridge structure was removed, several miles of unauthorized road were decommissioned, and dispersed recreation sites were defined to provide sustainable recreational opportunities. The project backed up water to reconnect the floodplain, side channels, and oxbows, which will increase the length of time the water stays in the project area. The project couldn't have been accomplished without our partners.

Partners included: Oregon Department of Fish and Wildlife (road closures and lodgepole encroachment removal), Rocky Mountain Elk Foundation, (riparian encroachment removal), Local community groups and citizens (garbage removal and dispersed recreation site rehab), Heart of Oregon Corps (fence building , recreation site rehab, and unauthorized OHV use restrictions).

For more information about this project, contact Kyle Wright, District Hydrologist (541-433-3262, [kyle.wright2@usda.gov](mailto:kyle.wright2@usda.gov)) or Jason Gritzner, Forest Hydrologist a(541-383-5537, [jason.gritzner@usda.gov](mailto:jason.gritzner@usda.gov)). For information about other aquatic restoration projects, contact Jason Gritzner or Jason Wilcox, Forest Fisheries Biologist (503-319-2408, [jason.wilcox@usda.gov](mailto:jason.wilcox@usda.gov)).



An excavator fills an illegal diversion ditch.



Project area water level prior to implementation.



Project area water level after implementation.



# Fremont-Winema National Forest North Fork Sprague River Restoration

The North Fork Sprague River Restoration project created floodplain terraces and stabilized streambanks with willow clump and sedge/sod matt transplants on USFS and private land. The project is within a priority watershed, a Wild and Scenic River corridor, and designated critical habitat for bull trout. Other important species in the project area include redband trout and Upper Klamath lamprey. A 4-strand barbed wire enclosure fence was constructed along the upper section of the project area in cooperation with the Forest Range Program to further assist in the recovery of the recently restored area.

Project highlights include:

- The project was covered under the Forestwide Programmatic Watershed Restoration Environmental Assessment and through a Decision Memo associated with the restoration of the Watson Creek Fire Area

(2018).

- The project utilized the regional Endangered Species Act and Clean Water Act (dredge and fill) programmatic permits.
- The project utilized a Wyden Agreement to work on private land.
- It improved aquatic habitat and riparian conditions on 1.5 miles of the NFK Sprague River for bull trout, redband trout, Upper Klamath lamprey
- The project was implemented using an interagency agreement with the BLM Lakeview District and supported by the permittee/adjacent landowner (J-Spear Ranch) and Forest Range Program.
- The Warner Creek Correctional Facility Work Crew constructed the riparian enclosure fence.



Streambank on J-Spear Ranch Before Restoration



Streambank on J-Spear Ranch After Restoration





The project was funded by the Fremont-Winema Aquatics Program (\$20,000) for implementation of the aquatic restoration component and the Forest Range Program (\$10,000) for fence materials and implementation of the riparian exclosure fence. External partners included Joe Villagrana (Manager, J-Spear Ranch, Paisley, OR), Jimmy Leal and Mike Clemens (BLM Lakeview), and the Warner Creek Correctional Facility Work Crew (Lakeview, OR).

For more information on this project contact Rich Pyzik, Eastside Fish Biologist (541-943-4440, [richard.pyzik@usda.gov](mailto:richard.pyzik@usda.gov)) or Tony Longacre Eastside Aquatics Technician (541-947-6330, [tony.longacre@usda.gov](mailto:tony.longacre@usda.gov)). For other aquatic restoration projects on the Fremont-Winema Forest, contact Phillip Gaines, Forest Fish Biologist (541-947-6258, [phillip.gaines@usda.gov](mailto:phillip.gaines@usda.gov)).



# Gifford Pinchot National Forest North Fork Lewis River, Reach 21 Phase 1 Restoration Project

The Upper North Fork Lewis River has minimal quality side channel habitat, a habitat component important for successful salmon and steelhead populations. Side channel habitat is lacking because of past land management activities such as logging, road building, and development of hydro-electric resources. Migratory fish, including salmon and steelhead, were excluded from the Upper NF Lewis River system by the Lewis River dams until the recent implementation of a trap and haul operation. To ensure successful reintroduction of salmon and steelhead into the watersheds above the dams, the Forest Service has worked with PacifiCorp and other partners on a variety of aquatic restoration projects. These projects include streambank and instream fish habitat restoration, aquatic organism passage projects, and road decommissioning. Now, the Upper NF Lewis River provides habitat for Chinook and coho salmon, steelhead, and bull trout.

The NF Lewis River Reach 21 Phase 1 Restoration project is the first in a series of planned stream restoration projects in the NF Lewis River to improve aquatic habitat and function through placement of large wood. The project restored a quarter mile section of river by adding large complex wood structures which will provide quality spawning, summer rearing, and overwintering habitat. The engineered log jams also provide high-quality hiding cover and increased residual pool depths in the side channel.

Considering the large yearly discharge of the NF Lewis River (reaching nearly 10,000 cfs, with 26,000 cfs occurring 2 years ago) large log jams are necessary to ensure the wood remains in the system. Log jams (90-150 logs each, approximately 600 logs with rootwads total) were added to the stream channel, side channels,



*Large wood structures constructed in the NF Lewis River.*

and associated floodplain of the NF Lewis River 0.1 miles up and downstream of the confluence with Rush Creek.

After instream project completion, 1.5 miles of road access to the project area were hydrologically stabilized, and a barrier was installed to exclude motorized vehicles from the riparian area.

Project implementation time was 17 days and project cost of \$145,000.

For more information on this project, contact Greg Robertson, Fisheries Biologist (509-395-3366, [greg.robertson2@usda.gov](mailto:greg.robertson2@usda.gov)). For more information regarding aquatic restoration projects on the Gifford Pinchot National Forest, please contact J.D. Jones, Fisheries Program Manager (541-219-078, [Joshua.d.jones@usda.gov](mailto:Joshua.d.jones@usda.gov)) or Kate Day, Forest Hydrologist (509-675-0075, [kate.day@usda.gov](mailto:kate.day@usda.gov)).



# Malheur National Forest

## Camp Valley Restoration, Phase 2

The Camp Valley Restoration Phase II project falls within the Lower Camp Creek priority subwatershed and the Collaborative Forest Landscape Restoration Program area. Camp Creek and its tributaries contain 32.1 miles of designated Middle Columbia River steelhead critical habitat. Restoration actions implemented in 2020 were identified in the Camp Creek Watershed Restoration Action Plan.

The purpose of this project was to restore instream and floodplain complexity, promote beaver activity, expand riparian vegetation, elevate the water table, facilitate sediment deposition to build streambanks and reduce width to depth ratios, increase quality pools, and reconnect floodplains isolated by legacy railroad grades. These actions will result in improved watershed health and increase survival rates of threatened juvenile Middle Columbia River steelhead.

Habitat potential in this reach is high. The unconstrained valley bottom, potential floodplain extent, low gradient, existing vegetation for beaver habitat and potential to

store water made this location an ideal site for restoration. This area was identified as having a high capacity for juvenile steelhead rearing, which is a main limiting factor in Camp Creek and the John Day Basin.

We constructed 84 primary log jams and 213 secondary floodplain or side channel structures on 2 miles of Camp Creek and the tributaries of Cottonwood and Cougar Creeks. We also planted 7,347 rooted cottonwoods, willows, and water birch in the floodplain. Legacy berms were removed throughout, reconnecting approximately 13.3 acres of floodplain habitat to the stream channel. Trees for the project were obtained by thinning encroaching conifers over a 30.3 acre area within the outer riparian habitat conservation area boundary.

The project was made possible through a partnership with The Confederated Tribes of Warm Springs Reservation of Oregon, Oregon Natural Desert Association, and the North Fork John Day Watershed Council.



*Secondary structures along reconnected floodplain where historic railroad grade was removed. These will prevent headcutting of future side channels.*





For more information on this project, contact Dan Armichardy, Blue Mountain Ranger District Fisheries Biologist (541-575-3391, [daniel.armichardy@usda.gov](mailto:daniel.armichardy@usda.gov)). Regarding other aquatic restoration projects within the Malheur National Forest, please contact Lindsay Davies, Fisheries Program Manager (541-575-3474., [lindsay.davies@usda.gov](mailto:lindsay.davies@usda.gov)) or Hazel Wood, Acting Forest Hydrologist (541-820-3892, [hazel.wood@usda.gov](mailto:hazel.wood@usda.gov)).



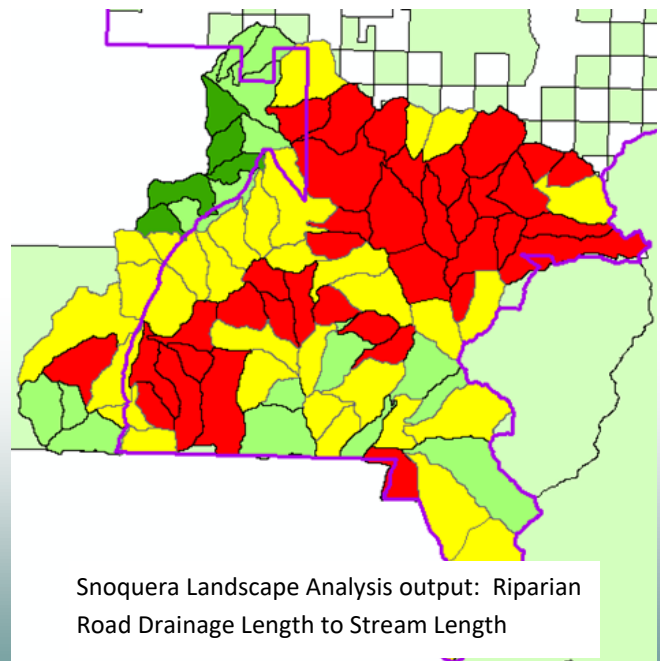
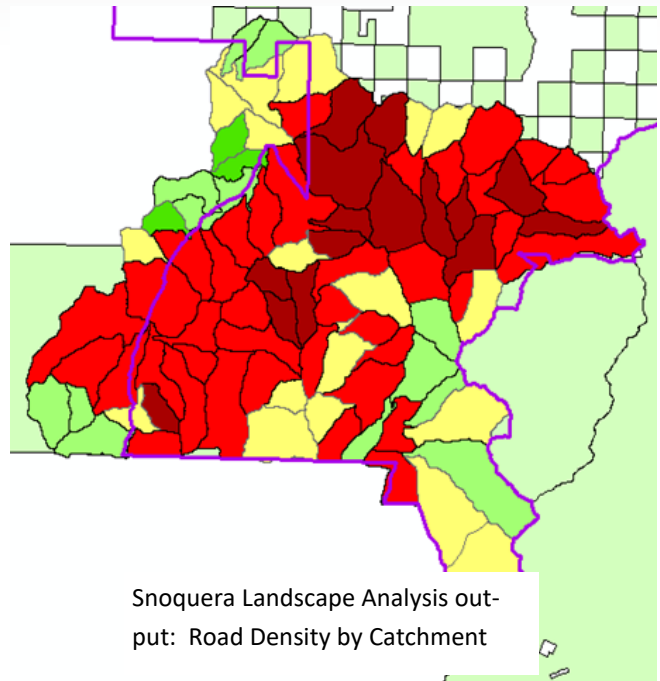
# Mt. Baker-Snoqualmie National Forest Snoquera Landscape Analysis

The Snoquera Landscape Analysis area included 116,000 acres on National Forest System lands in all or portions of 15 subwatersheds. Subwatersheds were broken into 500-1,200ac catchments, then rated based on several causal mechanisms. Proposed road treatments were targeted to decrease or eliminate various impairment mechanisms from the distribution and intensity of roads in floodplains or crossing streams at high densities (number of crossings per mile), road contribution to increase in drainage area (road drainage length to stream length), the amount and drainage contribution of roads in Riparian Reserves (generally within 300 feet of streams), and road density in smaller HUC14 watersheds or catchments (roads per square mile). Proposed road treatments were identified by first analyzing predicted road-derived effects on watershed conditions and then coupling that with field verification.

The assessment demonstrated that the legacy road network and use of associated infrastructure are primary drivers of water quality and fisheries habitat degradations, and this watershed-scale model represents a picture of the cumulative impacts to aquatic resources. The road networks were constructed on the landscape where they cut off floodplain processes, alter riparian structure, disrupt aquatic organism passage and natural flow regimes, increase sedimentation, and artificially increase the length of a watershed's drainage network. These factors have interacted cumulatively to influence conditions where aquatic resources have become less resilient.

The Snoquera project, developed from this analysis, was approved for implementation March 2020. It included a variety of work leading to improved aquatic and riparian conditions, including 24 miles of road decommissioning, 6 miles of storage treatments, and 54 miles of storm proofing in the upper White watershed (which overlies a 2017 decision to decommission 18 miles and store 68 miles of roads in the Greenwater priority watershed); 53 aquatic organism passage sites; riparian restoration at dispersed sites within five designated dispersed camping corridors totaling 24 miles; tree-tipping, the low-cost approach to instream wood enhancement to increase floodplain complexity; and variable density thinning of up to 5000 acres in Riparian Reserves to help restore

riparian function, including for shade and future large wood recruitment.





The Snoquera Landscape Restoration EA coupled with the Greenwater ATM EA, sets this landscape up for 15+ years of NEPA-ready shelf stock of aquatic projects. Furthermore, each restoration project is related to the larger watershed scale function and associated recovery of federally threatened fish stocks. This is in part due to the MBS Restoration Strategy having alignment with program emphasis items, such as Watershed Condition Framework (WCF) and using applicable science and associated methods in whole watershed/landscape level project design. In addition, the analysis helps support out-year planning efforts at the local level, as documented in watershed restoration action plans.

The lower Greenwater River is a WCF priority watershed for the MBS and a subset of the Snoquera projects are essential to moving the subwatershed toward an improved functioning condition. The Forest looks forward to continuing partnerships with area Tribes and groups such as Conservation Northwest and South Puget Sound Salmon Enhancement Group, as well as new collaborations with Blue Forest Conservation and WA Department of Natural Resources to build upon restoration activities occurring in the Snoquera project area. For example, in 2018 and 2019 Conservation Northwest completed non-system road and motorized trail decommissioning, as well as closure and rehabilitation of high use dispersed campsites.

For more information on this project and other aquatic restoration projects on the Mt. Baker-Snoqualmie National Forest, contact Richard Vacirca, Fisheries Program Manager (425-783-6040., [Richard.vacirca@usda.gov](mailto:Richard.vacirca@usda.gov)).



Culvert removal on road placed into storage in 2019



Deeply rutted user-created ATV trail before (left photo) and after rehabilitation in 2020 (right)



# Mt. Hood National Forest Clear Fork of the Sandy River Restoration

The Zigzag Ranger District of Mt. Hood National Forest partnered with the non-profit The Freshwater Trust (TFT) and National Oceanic and Atmospheric Administration (NOAA) to restore and enhance fish habitat in the Clear Fork of the Sandy River. The Clear Fork is a 7<sup>th</sup> field tributary identified as a key project area in the Upper Sandy River Watershed Restoration Action Plan (WRAP)

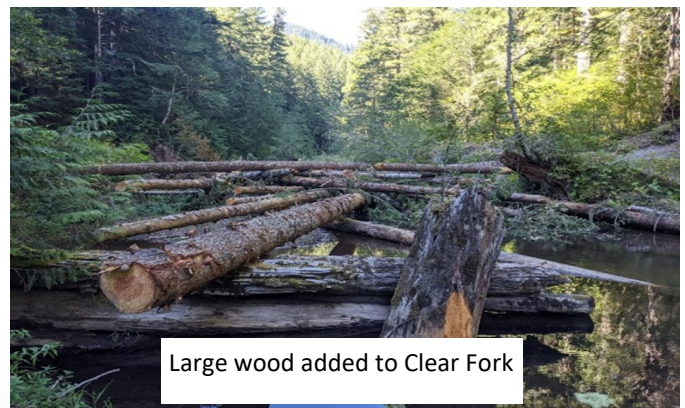


Large wood complexes added to Clear Fork

and provides vital spawning and rearing grounds for threatened Lower Columbia River (LCR) Chinook, LCR coho, and LCR steelhead. The stream has been disconnected from much of its floodplain due to road fill and large wood removal and it experiences unnaturally heightened flood events associated with a history of heavy logging and road construction. The result has been increased channel incision, a failure to naturally recruit large wood, and insufficient rearing habitat for juvenile salmonids. Restoration work on the Clear Fork focused on increasing large wood abundance, reconnecting floodplain habitat, and reducing peak flow velocities.

Restoration work on the Clear Fork began in 2019, when Partners used a helicopter to fly in 300 pieces of large wood into formerly clearcut portions of the upper watershed. Restoration projects in 2020 focused on the

lower watershed, where TFT and the Forest Service contracted with Aquatic Contracting to remove approximately 400 feet of road fill and berms that disconnected historic floodplains and added an additional 357 pieces of large wood into 25 log jams. A total of 630 feet of new side channels were opened and the river regained access to 12 acres of floodplain habitat. Project partners accomplished an additional 3.1 acres of riparian restoration through decommissioning dispersed campsites, blocking vehicle access to riparian areas, decompacting soils, and plantings Douglas Fir and Western Red Cedar seedlings. Furthermore, 8 culverts in the upper watershed were replaced to allow for aquatic organism passage and to mitigate the risk of culvert failure and potential debris torrents. Project completion is anticipated in 2021, when there's plans to replace at least two additional culverts and fly an additional 330 pieces of large wood into the middle watershed.



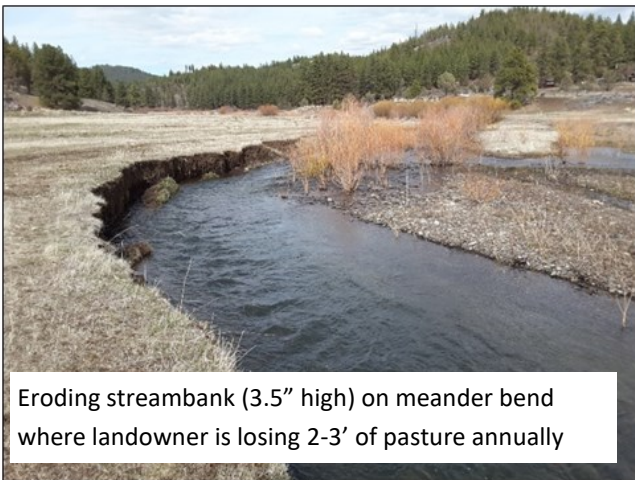
Large wood added to Clear Fork

For further information about this project, please contact Matt DeAngelo, Zigzag Ranger District Fish Biologist (503-622-2003, [matthew.deangelo@usda.gov](mailto:matthew.deangelo@usda.gov)). For information on other aquatic restoration projects on the Forest, contact Bruce Zoellick, Fish Program Manager (208-922-5547, [bruce.zoellick@usda.gov](mailto:bruce.zoellick@usda.gov)) or Todd Reinwald, Forest Watershed Program Manager (541-308-1732, [todd.reinwald@usda.gov](mailto:todd.reinwald@usda.gov)).



# Ochoco National Forest Mark's Creek Shared Stewardship

Since 2016, the U.S. Forest Service (USFS) and Crooked River Watershed Council (CRWC) have collaborated to improve habitat, watershed conditions, and water use efficiency. The replacement of two agricultural water diversions and restoration of 3,000 feet of stream and riparian areas addressed poor habitat and failing water diversions on USFS lands and adjacent private property. Utilizing the Wyden Authority, the USFS, CRWC and a private landowner successfully implemented this multi-faceted project. This project provides protection, restoration, and enhancement of fish and wildlife habitat and water-related resources necessary to achieve each party's objectives. The private landowner is working with the Natural Resources Conservation Service to enroll the project area in the Conservation Reserve Enhancement Program and construct a riparian buffer fence. The project was funded through an Oregon Watershed Enhancement Board and the USFS provided design and implementation support. For more information about this project contact Jon Kochersberger, District Hydrologist (541-416-6486, [jonathan.kochersberger@usda.gov](mailto:jonathan.kochersberger@usda.gov)). For information about other aquatic restoration projects, contact Jason Wilcox, Forest Fisheries Biologist (503-319-2408, [jason.wilcox@usda.gov](mailto:jason.wilcox@usda.gov)) or Jason Gritzner, Forest Hydrologist (541-383-5537, [jason.gritzner@usda.gov](mailto:jason.gritzner@usda.gov)).



Eroding streambank (3.5" high) on meander bend where landowner is losing 2-3' of pasture annually



Restored streambank with rootwad structure, decreased channel width, and increased pool depth



Original inefficient push-up dam water diversion



Relocated water diversion, with controllable headgate



# Okanogan-Wenatchee National Forest Volstead Road Decommission

Forest Service Road 4225-200 is a high clearance vehicle road within the Upper Beaver Creek sub-watershed on the Methow Valley Ranger District, Okanogan-Wenatchee National Forest. The road closely parallels Volstead Creek through a narrow valley, crossing the stream 11 times within 1.25 miles. Volstead Creek is a tributary to Beaver Creek, which is designated Critical Habitat for ESA listed Upper Columbia River steelhead and Columbia River bull trout. Although Volstead Creek is not designated critical habitat, recent electroshocking surveys identified rainbow trout/juvenile steelhead at multiple locations within the stream.

Between 2011 and 2017, the 4225-200 road failed 4 times during spring high stream flows and has been repaired in place by Federal Highways using Emergency Relief for Federally Owned Roads (ERFO) and other road maintenance funds 3 times. After the 4th road failure, the Forest Service worked with Federal Highways to decommission the road in anticipation of the road having further recurring problems due to the erosive geology of the watershed, the unstable nature of Volstead Creek, the location of the road, and the number of stream crossings. The Volstead Road accesses a large block of Matrix land managed for timber production, livestock grazing, and fire suppression access. It's also a popular hunting and outdoor recreation area. Reducing motorized access to the area was controversial, however in 2020 the Methow Valley Ranger District, working with Federal Highways was able to decommission the lower 1.25 miles of the Volstead Road and remove 11 culverts using ERFO funding (~\$245,000). For more information on this project or other aquatic restoration projects on the Okanogan-Wenatchee National Forest, contact Emily Johnson, Fisheries Program Manager (509-664-9326, [emily.johnson2@usda.gov](mailto:emily.johnson2@usda.gov)) or Molly Hanson (509-664-9330, [molly.hanson@usda.gov](mailto:molly.hanson@usda.gov)).



Multiple Volstead Road failures during high flow events between 2011 and 2017



A decommissioned segment of the Volstead Road



A road-stream crossing removed during the project



# Olympic National Forest

## Dungeness River Large Wood, Phase 2

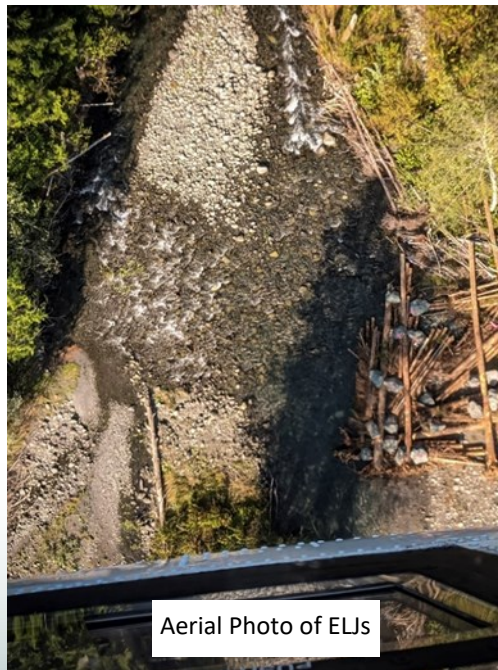
The Olympic National Forest and the Jamestown S’Klallam Tribe collaborated to implement the construction of 13 engineered log jams (ELJs) to improve fish habitat and benefit Tribal Trust resources in the Dungeness River. Fish habitat on National Forest lands in the upper watershed are a refugia for fish populations at risk. Three fish species listed as threatened under the federal Endangered Species Act (ESA) are present in the project area within the Dungeness watershed and returning numbers of all listed fish species are chronically low. Subsequently, habitat restoration in the Dungeness River is identified as a key recovery action in the recovery plan for Puget Sound Chinook. The floodplain and river restoration on the Dungeness River was designed to accelerate the recovery of channel processes and improve fish habitat by increasing both spawning and rearing

habitat. Approximately 120 second growth trees were removed from approximately two acres of second-growth forest in the Adaptive Management Area land management allocation, creating a variety of small openings benefitting wildlife. Salmon recovery funding supported local employment by hiring local firms and contractors to design and construct this infrastructure project.

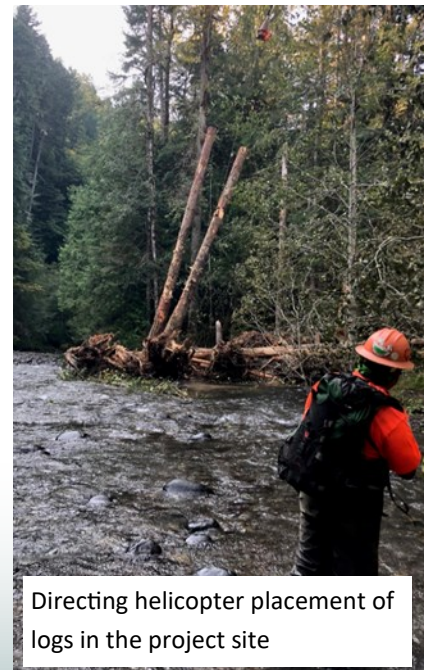
For more information on this project or other aquatic restoration projects on the Olympic National Forest, contact Dana Butler, Watershed Program Manager (360-956-2280, [dana.butler2@usda.gov](mailto:dana.butler2@usda.gov)).



Aerial Photo of ELJs



Aerial Photo of ELJs



Directing helicopter placement of logs in the project site

Left and Center photo credit : Columbia Helicopter, Inc



# Rogue River-Siskiyou National Forest Panther Creek Restoration

The Panther Creek Large Wood Placement and Riparian Vegetation Planting Project (Panther Creek Project) is being implemented in cooperation with the Curry Watersheds Partnership, Bureau of Land Management (BLM), Oregon Watershed Enhancement Board (OWEB), and private landowners.

Panther Creek is a tributary to the Chetco River and is situated within the Nook Creek sub-watershed. The subwatershed has degraded fish habitat and hydrologic conditions as a result of past timber harvest in riparian zones, road building activities, and more recently, the 2017 Chetco Bar Fire which severely burned the Panther Creek drainage.

*Panther Creek provides critical habitat for the Southern Oregon/Northern California Coastal (SONCC) coho salmon, which are listed as threatened under the Endangered Species Act (1973). Panther Creek also provides habitat for brook lamprey, coastal cutthroat, and steelhead; and drinking water for the cities of Brookings and Harbor.*



Panther Creek looking upstream. Note the small diameter of wood and dead trees from the 2017 Chetco Bar Fire adjacent to this low gradient reach of Panther Creek.

The Panther Creek Project will improve water quality and fisheries habitat by building log structures that trap and store sediment.



An example of deposition upstream of a log structure, building streambanks and retaining sediment.

*In 2020, work was implemented on private land immediately upstream of the Panther Creek – Chetco River confluence. Approximately 25 whole trees were pushed over and used to build log structures within ~500 feet of Panther Creek. The structures were “keyed” into the streambanks to secure the logs and to increase interaction with the active channel. A culvert was also replaced on a tributary to Panther Creek to improve road access to the private and downstream BLM lands.*

*In the winter of 2021, approximately 2,500 seedlings will be planted to increase shade and slope stability on ~2 acres of private and ~30 acres of National Forest System (NFS) and BLM riparian reserves. The seedlings will be a mix of native trees and shrubs.*



*In the summer of 2021 (July 15th to September 30th), burned trees on BLM and NFS lands will be pulled or felled into Panther Creek to construct large, channel spanning log jams at bedrock and boulder channel constrictions; to aggrade the upstream channel; and produce lower gradient, “productive flats”. Additional log structures will be built within these flats to enhance spawning and rearing habitat.*

*In total, approximately 1 mile of NFS Lands, 0.5 miles of BLM Lands, and 0.1 miles of private lands will be enhanced. Project costs are estimated at \$65,000. Funding will come from the BLM and OWEB, and the private landowner will provide logs and rock as an in-kind contribution to the project.*

For more information about this and other aquatic restoration projects on the Rogue River-Siskiyou National Forest, please contact Steve Burns, Fisheries Program Manager (541-618-2052, [stephen.burns@usda.gov](mailto:stephen.burns@usda.gov)) or Lizeth Ochoa, West Zone Soil Scientist and Hydrologist (541-247-3667, [Lizeth.ochoa@usda.gov](mailto:Lizeth.ochoa@usda.gov)).



Whole trees were collected and placed in Panther Creek.



A log structure is being “keyed” into the streambank to secure the logs and increase interaction with the active channel.



Log structures placed in the active channel help to slow velocities and aggrade the upstream channel; as well as scour pools for rearing.



# Siuslaw National Forest

## Fivemile-Bell Restoration — Phase 5

The Fivemile Bell Restoration Project is a valley bottom reconstruction project designed to restore natural function to this Tahkenitch Lake tributary, a focus watershed for the Siuslaw NF. These lake tributaries have extremely high potential for coho production as seen in nearby Leitel Creek, which has the highest density of adult coho spawning on the central Oregon coast, with spawning densities up to 2,000 adult coho salmon per mile. Fivemile and Bell creeks had been highly altered through conversion of the valley bottom to agricultural lands and ditching of most of the stream system in the valley. Since 2013, the Siuslaw NF has been restoring Fivemile Bell and in 2020 the Central Coast Ranger District completed Phase 5 of the Fivemile-Bell Restoration Project. Over 112 acres of floodplain and native plant communities have been restored and protected, 6 miles of stream restored, and 4 passage barriers removed.

The Fivemile-Bell Restoration Project, Phase 5, continued to increase the quantity and quality of rearing habitat for the Coastal Lakes population of Oregon Coast coho, and associated flora and fauna, in the short term through restoration of in-stream and floodplain habitat complexity, and in the long term through the restoration of natural watershed processes that maintain habitat complexity. This goal has been consistent throughout all phases of the Fivemile-Bell Restoration Project.

### The following objectives were completed in 2020

#### Objective #1

Five acres Middle Bell Creek were regraded, creating valley-wide flow paths across the floodplain, at elevations that will encourage inundation at most flows. Wetlands are expected to develop in designed backwater areas, as well as the tributary junction located in the Phase 5 re-grade area. The re-grade elevations were designed to match valley floor elevations from the areas completed in the first four phases of the project.





### Objective #2

Portions of the incised Middle Bell Creek channel were filled to increase floodplain interaction and raise the water table. Isolated sections of the current channel were left to provide deep water habitat for juvenile and adult salmonids while habitat complexity develops on the regraded valley floor flow paths. As in past phases, non-native vegetation including Himalayan blackberry and reed canary grass were removed and cleaner fill material was compacted to the valley regrade elevation. Large wood material was placed across the valley floor, as in previous phases, to reduce stream power. Some wood was partially embedded into the valley floor while the rest was scattered to improve roughness.

### Objective #3

Portions of the channel in Fivemile Creek between Phases 3 and 4 were filled to increase floodplain interaction, raising the water table closer to the floodplain elevation.

### Objective #4

Approximately 200 trees with root wads and 25 mature cut trees were placed in-stream and on the floodplain throughout the entire Fivemile-Bell Project area in all phases.

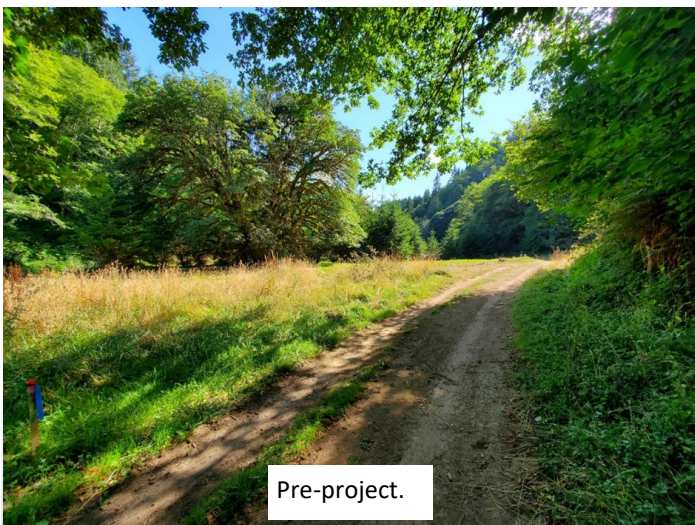
### Objective #5

We obliterated 1.5 miles of valley-bottom road along Bell Creek from the confluence of Bell and Fivemile Creek to the end of the road with Bell Creek, re-establishing the natural hydrologic processes and minimizing erosion. The road was decompacted and replanted with native vegetation. All stream crossings were removed.

### Objective #6

Since 2012 approximately 10 miles of old cat roads that were used for timber harvest in the 1960's have been decommissioned in the Fivemile Valley. An additional 2 miles of old cat road were decommissioned in 2020 using an excavator to decompact and recontour the roadbed, restoring drainage patterns on the hillsides and reducing potential for water diversion, erosion, and landslides. Native vegetation, including trees and shrubs, will be planted this fall (2020).

For more information on this project and other aquatic restoration projects on the Siuslaw National Forest, contact Brandy Langum, Fisheries Program Manager (541-750-7034, [brandy.langum@usda.gov](mailto:brandy.langum@usda.gov)) or Kami Ellingson, Watershed Program Manager (541-750-7101, [kami.ellingson@usda.gov](mailto:kami.ellingson@usda.gov)).





# Umatilla National Forest

## Granite Creek RM 7.5 Restoration

The original plans for this stream restoration project contained two segments of stream and riparian area which roughly divided the project site in half. One was on Umatilla National Forest (UNF) land and the other (upstream) was on private land. Groundwater affecting a project site and contractor capacity issues resulted in only work on UNF land in 2020.

The UNF supplied trees from a nearby commercial thinning unit and boulders from a nearby pit. UNF also provided staff time to assist in planning and implementation and fish and amphibian salvage. Amphibian salvage was added to the standard fish salvage requirement after discussion between USFWS staff and Confederated Tribes of the Umatilla Indian Reservation (CTUIR).

Implementation began in July 2020 with UNF Fire staff felling trees in a nearby commercial thinning unit that was laid out for sale but not sold. CTUIR transported the trees and stockpiled them for use.

Some amphibian salvage occurred throughout the project. Primarily Columbia spotted frogs in various life

stages and larval long-toed salamanders were salvaged and translocated to ponds nearby. Salvaged fish species included a substantial number of juvenile spring Chinook salmon and ESA-listed (threatened) Mid-Columbia River steelhead, and over one hundred lamprey ammocoetes (presumably Pacific lamprey). Several adult spring Chinook salmon were moved upstream prior to when work on that area began. Restoration plans had to be modified slightly due to higher than expected groundwater levels caused by a wet spring and early summer. After work began, several areas that appeared dry and where it was expected heavy equipment could work became wet and heavy equipment could no longer be operated without damage to soils.

Instream work was completed within the instream work window. Work continuing into the fall consisted of seeding with native vegetation and planting willow (primarily) and alder stems along stream banks. Erosion control measures such as silt fencing and wattles were also installed. Rock and trees were stockpiled on the private land section for use in 2021.



Pre-project Granite Ck, disconnected from floodplain.



Post-project rerouted Granite Creek with added in-stream complexity.



Restoration activities completed on UNF land in 2020 included rerouting of the main stream channel to create more sinuosity, elevating the stream channel, creating riffles, reopening old side channels, and installing boulder and tree structures (including beaver dam analogs) in main and side channels. The linear distance of the main channel restored was about 0.2 miles with similar distance in new or reactivated side channels.

Restoration is expected to improve hydrologic functioning and floodplain resiliency, benefitting fish, amphibians, and other aquatic and riparian species.

For more information on this project and other aquatic restoration projects on the Umatilla National Forest, please contact Brien Park, Watershed Program Manager and Forest Soil Scientist (541-278-3822, [brien.park@usda.gov](mailto:brien.park@usda.gov)) or Kathy Ramsey, Forest Fisheries Biologist, (541-278-3933, [katherine.ramsey@usda.gov](mailto:katherine.ramsey@usda.gov)).



Post-project Granite Creek with re-established main channel and constructed riffle.



# Umpqua National Forest Lower Emerson Creek AOP

Emerson Creek is an important tributary to the upper portion of the mainstem South Umpqua River. It enters the mainstem within the Skillet-Emerson 6<sup>th</sup> field watershed, which contains the core of the South Umpqua Spring Chinook spawning habitat. The Skillet-Emerson 6<sup>th</sup> field watershed was selected as a priority watershed because approximately 90% of the South Umpqua Spring Chinook Salmon hold and spawn in a 5 mile stretch of the river adjacent to Emerson Creek. Some of the best aquatic habitat in the South Umpqua for Winter steelhead is also found in this same 5 mile reach.

This project was part of a much larger scale restoration project to restore aquatic habitat by converting a mile segment of riparian paved road to a foot trail, reducing Spring Chinook poaching/harassment and riparian habitat degradation associated with dispersed camp

sites, and constructing a new, single span bridge crossing the river. The new bridge replaced a bridge whose superstructure was constructed with toxic wood and included a mid channel support which made the bridge a failure risk during flood events. The final component of the project was the Emerson Creek aquatic organism passage/culvert removal project.

The whole project, including the road to trail component and new bridge and culvert removal cost, was 1.5 million dollars and included the following partners: Oregon Watershed Enhancement Board, GEOS Institute, and the South Umpqua Rural Community Partnership.

For more information on aquatic restoration projects on the Umpqua National Forest, contact Bob Nichols, Fisheries Program Manager (541-957-3360, [robert.nichols@usda.gov](mailto:robert.nichols@usda.gov)) or Joe Blanchard, Watershed Program Manager (541-957-3356,



*Pre-project Emerson Creek crossing perched outlet*



*Post-project Emerson Ck removal of culvert to provide passage for aquatic organisms.*



# Wallowa-Whitman National Forest

## Lower Fly Creek Restoration

In 2020, the Wallowa-Whitman National Forest implemented the Lower Fly Creek Restoration Project to achieve proper ecological form and function of Lower Fly Creek, benefitting imperiled Snake River Basin Spring/Summer Chinook and Snake River Basin steelhead.

The project added wood to lower Fly Creek to increase groundwater retention, increase side channel flow for improved salmonid rearing habitat, and restore main channel habitat complexity. The wood complexes were constructed both on National Forest land and adjacent private land owned by Todd Smith.

The Forest constructed full spanning debris jams at 80 sites within the lower 3.5 miles of Fly Creek. This included 1,550 large wood pieces, 2,140 yards of racking material, and 160 boulders. The wood for these restoration structures was collected from outer riparian areas, leaving those trees located closer to the stream standing for future instream recruit.

In addition to the construction of wood complexes, the project recontoured road surfaces and planted riparian

areas. A dozer and 2 excavators recontoured 2.5 miles of stream bottom road adjacent to Fly Creek. There were 20,000 deciduous and conifer seedlings planted within the project area and all disturbed areas were seeded.

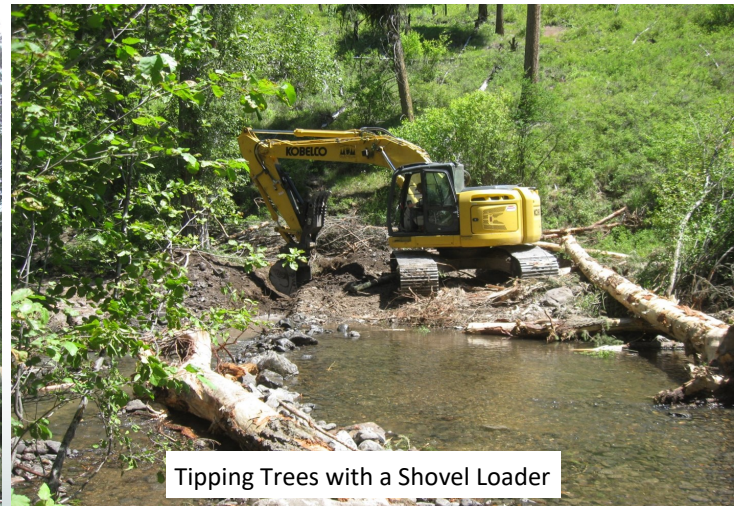
Approximately .75 miles of the project area consisted of private lands owned by Todd Smith. Todd Smith entered into an agreement with the USFS to complete fish structure construction on his property.

Immediate results of the restoration included new backwater pools formed at the channel spanning debris jams (up to 3' of increased depth), elevated water tables, and approximately .5 mile of perennial side channel activation.

Expected long term results include 14% increase in floodplain inundation during the low flow period, increased activation of side channels during all seasons, elevated water tables, increased flow during the low flow season, decreased water temperatures, and increased beaver recruitment.



Excavator transporting a tree with rootwad



Tipping Trees with a Shovel Loader



Partners included USFS, BPA, Grande Ronde Model Watershed (GRMW), Confederated Tribes Umatilla Indian Reservation (CTUIR), and Todd Smith. The total project cost was \$545,561. Bonneville Power Administration contributed \$325,394 and the USFS contributed \$220,167 to the project.

For more information on this and other aquatic restoration projects on the Wallowa Whitman National Forest, contact Cecil Rich, Forest Aquatic and Watershed Program Manager (907-227-3509, [cecil.rich@usda.gov](mailto:cecil.rich@usda.gov)).

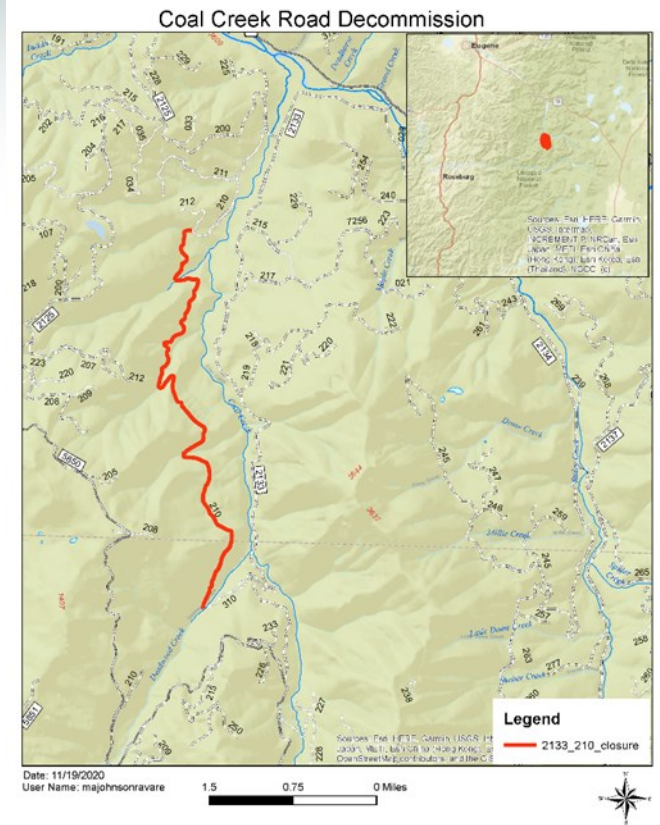


Completed log structures at Fly Creek



# Willamette National Forest Coal Creek Road Decommission

In July 2020, the Middle Fork Ranger District of the Willamette National Forest decommissioned 5.6 miles of FS Road 2133-210, a mid-slope road running parallel to Coal Creek. This road was identified as one of the eight highest priority roads to decommission in the Upper Middle Fork Willamette Watershed Action Plan (2009) and was identified as an essential project in the Coal Creek Watershed Restoration Action Plan (2018). A tributary to the Middle Fork Willamette River, Coal Creek is Critical Habitat for ESA-listed bull trout and spring Chinook salmon. During the 1996 flood, crossings in this road failed and directly impacted Coal Creek below. Treatment of this road will prevent future failures and contribute to the restoration of properly functioning condition in Coal Creek sub-watershed.







The decommission included removal of fifteen road/stream crossings, the deepest of which was 45 feet at the outlet. Galvanized culverts were removed from the site and fill material was placed in stable locations nearby. Native seed and straw were placed on laid back fill slopes of these removals to reduce erosion. Work also included non-drivable water bars, outside fill pull back and a berm barricade on the 5.6-mile treatment area. Total project cost was \$121,860, including \$19,860 in retained receipts generated under Forest Service Stewardship Authority. The contract was awarded to Complete Brush Cutting LLC who finished the work within 30 days of the start date.

For more information on this project and other aquatic restoration projects on the Willamette National Forest, contact Johan Hogervorst, Forest Hydrologist, (541-225-6430, [johan.hogervorst@usda.gov](mailto:johan.hogervorst@usda.gov)) and Brett Blundon, Forest Fisheries Biologist (541-225-6439, [brett.blundon@usda.gov](mailto:brett.blundon@usda.gov)).



Fill and pipe removal on FS 2133-210 road decommission in Coal Creek WCF Priority Sub-watershed.



## Locations of the National Forest in the Pacific Northwest Region of the USDA Forest Service







Tomlinson Creek Aquatic Organism Passage Project (before on left and after on right) . This is a [Salmon Superhighway Partnership](#) project benefitting aquatic resources and motorist safety near the Siuslaw National Forest.

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